

REMARKS

Claims 1-12, and 17-48 were rejected and claims 13-16 were indicated allowable. Claims 1, 5, 6, 7, 8, 11, 12, 40, and 45 have been amended. New claims 49-55 have been added. Substitute pages of the specification have been provided via the appendix of pending claims provided herewith.

The Examiner is thanked for noting in a Detailed Action that there were two claims numbered "6", and for renumbering the second occurrence claim 6 as claim 7 (Rule 126).

The Examiner also noted embedded hyperlinks and blanks in the Specification; Applicants believe that the above amendments to the specification appropriately correct these informalities.

The Examiner objected to claim 37 because it was followed by two periods. The informality in claim 37 has been corrected by amendment. The Examiner objected to claim 45 because it was missing an article before the word "multiple". Claim 45 has been amended to address this informality. The Examiner also objected to claim 48. Because Applicant cancelled claim 48, the informality is moot.

The Examiner rejected claims 6, 7, and 40-45 under 35 U.S.C. § 112, second paragraph. Specifically, the Examiner indicated that claims 6 and 7 recite "said values" which lacks antecedent basis, and that claim 6 recites "amino acid letter" which is confusing because it is not clear what is meant by a "letter" in this context. Claims 5, 6, and 7 have been amended to address these rejections. Specifically, in claim 5, the "numeric or logical values" has been changed to "a plurality of numeric or logical values". Dependent claims 6 and 7 have been amended to reflect this change. Also, claims 6 and 7 have been changed to more clearly express the intent of the term "letter". The term "letter" in claims 6 and 7 is meant to define a one-letter designation for a nucleotide or amino acid, respectively. Support for this is found in the specification on page 15, lines 1-4, "...numeric values can be converted into a nucleotide or amino acid letter. Once converted into a corresponding nucleotide representation, the fingerprints can be analyzed and compared using software and algorithms known in the art for genetic and peptide sequence comparisons...", that is, standard one-letter designations known in the art for nucleotides and amino acids. The Examiner rejected claim 40 and dependent claims 41-45 for reciting "said morphometric value" which lacks antecedent basis. Claim 40 has been

amended to address this rejection; “morphometric” has been replaced with “morphological” as originally intended, and thus antecedent basis is established.

The Examiner rejected claims 1-6 and 8-10 under 35 U.S.C. § 102(b) as being anticipated by “Biodx” (WO 97/45730, 12/4/97, PTO-1449 reference AC). The Examiner has also allowed claims 13-16. To expedite prosecution, Applicants have amended independent claims 1 and 8 to incorporate, in Markush format, the manipulations recited in allowed claims 13-16. Note that Applicants also incorporated “a nuclear radiation factor” as an additional Markush element. This element will be discussed below. It is respectfully submitted that this amendment overcomes the rejection based on Biodx.

The Examiner also rejected claims 1-5 and 8-12, and 17-48 under 35 U.S.C. § 102(b) as being anticipated by Pauwels (Journal of Pharmacological and Toxicological Methods, Vol. 37, March 1997, pages 105-115, PTO reference AE). As mentioned, independent claims 1 and 8 have been amended to incorporate the manipulations of the allowed claims 13-16. Independent claim 40 has also been amended to incorporate these manipulations. As mentioned, the manipulation “applying a nuclear *radiation* factor” has been added to independent claims 1, 8, and 40. Applicants respectfully submit that the manipulation “applying a nuclear factor” as recited in original claim 18 is allowable, because it is meant to encompass nuclear irradiation but not “chromatin” as stated by the Examiner on page 5 of the office action. At various locations in the specification, Applicants distinguished “biological” and “nuclear” factors. See page 4, lines 14-17, for example. Further at page 12, line 9, the specification states that “[m]anipulations could also include irradiation.”

The Examiner rejected claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Pauwels (Journal of Pharmacological and Toxicological Methods, Vol. 37, March 1997, pages 105-115, PTO reference AE) in view of Weinstein (Science, Vol. 275, 17 Jan 1997, pages 343-349, PTO-1449 reference AJ). Because claim 31 depends from claim 8, and claim 8 now incorporates the manipulations of the allowed claims 13-16, the rejection of claim 31 is respectfully traversed.

Finally, new claims 49-55 are respectfully submitted as allowable because prior art does not teach or suggest manipulation of cell cultures using the various biological elements recited in the Markush group listed in independent claim 49.

Applicants believe that claims 1-12, 19-41, 44, 45, and 49-55 are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

A handwritten signature in black ink, appearing to read 'Jeffrey K. Weaver', written in a cursive style.

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APPENDIX OF PENDING CLAIMS

All currently pending claims are reproduced below for the Examiner's convenience.

1. (Amended) A computer program product for populating a database with manipulated biological information, said computer program product comprising:
 - code for providing a plurality of cells in various stages of the cell cycle, said stages of the cell cycle including at least one selected from interphase, G0 phase, G1 phase, S phase, G2 phase, M phase, prophase, prometaphase, metaphase, anaphase, and telophase;
 - code for applying a manipulation to said cells in said various stages of cell cycle development to form a plurality of manipulated cells, wherein said manipulation is selected from the group consisting of an electromagnetic factor, a gravitational factor, a mechanical factor, a thermal factor, a nuclear radiation factor, and combinations thereof;
 - code for capturing an image of said plurality of manipulated cells;
 - code for determining a descriptor from said image for said manipulated cells;
 - code for populating a database with said descriptor;
 - wherein said image includes a first component of a cell and a second component of said cells; and
 - a computer readable storage medium for holding the codes.
2. The computer program product of claim 1 wherein said first component and said second component are selected from a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure and an organelle.
3. The computer program product of claim 1 wherein said image is a digitized representation of said plurality of manipulated cells.
4. The computer program product of claim 3 wherein said digitized representation provides a density value of said plurality of manipulated cells.
5. (Amended) The computer program product of claim 1 wherein said descriptor comprises a plurality of numeric or logical values.

6. (Amended) The computer program product of claim 5 wherein said plurality of numeric or logical values further comprise one letter designations for nucleotides.

7. (Amended) The computer program product of claim 5 wherein said plurality of numeric or logical values further comprise one letter designations for amino acids.

8. (Amended) A computer program product for determining a property of a manipulation based upon effects of said manipulation on at least two of a plurality of components of at least one of a plurality of cells, said computer program product comprising:

code for providing at least one of a plurality of samples of said manipulation to said at least one of a plurality of cells, wherein said manipulation is selected from the group consisting of applying an electromagnetic factor, applying a gravitational factor, applying a mechanical factor, applying a thermal factor, applying a nuclear radiation factor, and combinations thereof;

code for determining at least one of a plurality of features of said at least two of a plurality of components of at least one of a plurality of cells in the presence of said manipulation;

code for determining at least one of a plurality of descriptors, said descriptors comprising at least one of said plurality of features;

code for searching a plurality of descriptors obtained from a database to locate descriptors based upon one of said descriptors of said manipulation, said searching forming a plurality of located descriptors;

code for determining, based upon said located descriptors, properties of said manipulation based upon said located descriptors;

wherein said two of a plurality of components includes a first component and a second component of a cell, said code for determining at least one of a plurality of descriptors of a state comprises code for combining information about said first component and said second component; and

a computer readable storage medium for holding the codes.

9. The computer program product of claim 8 wherein said plurality of components are selected from a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure, and an organelle.

10. The computer program product of claim 8 wherein said code for determining a said plurality of located descriptors further comprises code for determining a plurality of matching descriptors, said matching descriptors corresponding to a prior administration of said manipulation, said prior administration of said manipulation having at least one of a plurality of properties.

11. (Amended) The computer program product of claim 8 wherein said code for providing a manipulation further comprises code for applying a chemical factor.

12. (Amended) The computer program product of claim 8 wherein said code for providing a manipulation further comprises code for applying a biological factor.

19. The computer program product of claim 8 wherein said properties comprises toxicity.

20. The computer program product of claim 8 wherein said properties comprises specificity against a subset of tumors.

21. The computer program product of claim 8 wherein said properties comprises a mechanism of chemical activity.

22. The computer program product of claim 8 wherein said properties comprises a mechanism of biological activity.

23. The computer program product of claim 8 wherein said properties comprises a target protein.

24. The computer program product of claim 8 wherein said properties comprises a mechanism of action.

25. The computer program product of claim 8 wherein said properties comprises a structure.

26. The computer program product of claim 8 wherein said properties comprises at least one of a plurality of adverse biological effects.

27. The computer program product of claim 8 wherein said properties comprises at least one of a plurality of biological pathways.

28. The computer program product of claim 8 wherein said properties comprises at least one of a plurality of adverse clinical effects.

29. The computer program product of claim 8 wherein said properties comprises at least one of a plurality of cellular availability.

30. The computer program product of claim 8 wherein said properties comprises at least one of a plurality of pharmacological properties.

31. The computer program product of claim 8 wherein said properties comprises a gene expression profile.

32. The computer program product of claim 30 wherein said pharmacological properties comprises absorption.

33. The computer program product of claim 30 wherein said pharmacological properties comprises excretion.

34. The computer program product of claim 30 wherein said pharmacological properties comprises distribution.

35. The computer program product of claim 30 wherein said pharmacological properties comprises metabolism.

36. The computer program product of claim 8 wherein said properties comprises pharmacodynamic properties.

37. (Amended) The computer program product of claim 8 wherein said properties can be selected from clinical uses and indications, human and veterinary diagnostic uses and tests, or human and veterinary prognostic uses and tests.

38. The computer program product of claim 8 wherein said descriptor comprises a scalar.

39. The computer program product of claim 8 wherein said descriptor comprises a vector.

40. (Amended) A computer program product for mapping a plurality of cells after applying a manipulation to said plurality of cells, based upon a morphological value, said computer program product comprising:

code for capturing the morphological value from said plurality of manipulated cells, wherein said manipulation is selected from the group consisting of applying an electromagnetic factor, applying a gravitational factor, applying a mechanical factor, applying a thermal factor, applying a nuclear radiation factor, and combinations thereof;

code for assigning a degree of presence of said morphological value; and

code for storing said morphological value and said degree of presence;

wherein said morphological value is derived from a first component of a cell and second component of said cell, said code for capturing said morphological value from said plurality of cells comprises code for determining a relationship between said first component and said second component; and

a computer readable storage medium for holding the codes.

41. The computer program product of claim 40 wherein said first component and said second component are selected from a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a subcellular structure and an organelle.

44. The computer program product of claim 40 wherein said morphological value is selected from a count, an area, a perimeter, a length, a breadth, a fiber length, a fiber breadth, a shape factor, a elliptical form factor, an inner radius, an outer radius, a mean radius, an equivalent radius, an equivalent sphere volume, an equivalent prolate volume, an equivalent

oblate volume, an equivalent sphere surface area, an average gray value, a total gray value, and an optical density.

45. (Amended) The computer program product of claim 40 wherein said degree of presence is a multiple of a quantized value.

49. (New) A computer program product for determining a property of a manipulation based upon effects of said manipulation on at least two of a plurality of components of at least one of a plurality of cells, said computer program product comprising:

code for providing at least one of a plurality of samples of said manipulation to said at least one of a plurality of cells, wherein said manipulation is selected from the group consisting of applying a hormone, applying a growth factor, applying an extracellular matrix component, applying a virus, applying an electroporation, applying an antisense polynucleotide, applying a gene knock-out, applying a gene overexpression, applying a gene mutation, applying a cell fusion, and combinations thereof;

code for determining at least one of a plurality of features of said at least two of a plurality of components of at least one of a plurality of cells in the presence of said manipulation;

code for determining at least one of a plurality of descriptors, said descriptors comprising at least one of said plurality of features;

code for searching a plurality of descriptors obtained from a database to locate descriptors based upon one of said descriptors of said manipulation, said searching forming a plurality of located descriptors;

code for determining, based upon said located descriptors, properties of said manipulation based upon said located descriptors;

wherein said two of a plurality of components includes a first component and a second component of a cell, said code for determining at least one of a plurality of descriptors of a state comprises code for combining information about said first component and said second component; and

a computer readable storage medium for holding the codes.

50. (New) The computer program product of claim 49 wherein said plurality of components are selected from a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure, and an organelle.

51. (New) The computer program product of claim 49 wherein said code for providing a manipulation further comprises code for applying a chemical factor.

52. (New) The computer program product of claim 49 wherein said properties comprises toxicity.

53. (New) The computer program product of claim 49 wherein said properties comprises a mechanism of action.

54. (New) The computer program product of claim 49 wherein said properties comprises at least one of a plurality of pharmacological properties.

55. (New) The computer program product of claim 54 wherein said pharmacological properties comprises at least one of absorption, excretion, distribution, and metabolism.